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# GARDEN AND FOREST

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JUNE 24 1891

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**DAFFODILS:**
Irish-grown versus Dutch.

I am pleased to see a notice from Mr. Orpet on this subject in Garden and Forest for May 20th, 1891. It is only what I have anticipated for years. One thing I would very much like to hear as being tested. I don't know Mr. Orpet, or would ask him why "Trumpet Major" is asked for from Europe in preference to a good type of "Bicolor Princeps," of equal money value. For my part I put "Dutch Major" in the rubbish heap and burned it three years since. "Spurius" or single "Von Sion" (*true*) is a very fine variety for forcing, plentiful in Dutch gardens, in the same way as "Ard Righ," but not so early.
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# Garden and Forest.

Among the contents of next week's issue (No. 175) will be the following articles:

**The President and the Public Forests.**
Editorial.

**How We Renewed an Old Place.—XI.**
By Mrs. J. H. Robbins.

**Sabal Blackburniana.** (With illustration.)

**The Hardy Plant Garden.**
By J. N. Gerard.

The paper will contain an illustration of Sabal Blackburniana, from a photograph.

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## The Bermuda Juniper.

THE principal tree of the Bermuda flora is the Juniper, which covers the islands and makes the conspicuous feature of their vegetation. A few other trees grow naturally on these islands, and several others have been carried to them by man and have now become more or less firmly established. No tree but the Juniper, however, makes much show on the islands, which, from a distance, seem to be completely covered with it.

This Juniper has been growing on Bermuda for a long time. The wood, in the condition of lignite, was found at the depth of fifty feet below low-water mark during the dredging operations undertaken by the British Government in connection with the building of the Bermuda dry-dock. Subsidence of land is slow unless it is the result of some violent catastrophe, like an earthquake, and the fact that this Juniper grew on ground which is now far below the surface of the ocean is conclusive evidence that it has occupied these islands for a period so long that the mind of man, accustomed to measure time by years or by centuries, cannot form a clear notion of its immensity.

How did the Juniper first get to Bermuda? By what process did this tree, which is unlike other trees of its kind, first appear on these minute islands remote from all other land, and raised from the bed of the ocean by the patient toil of insects, long after the neighboring continent had assumed very nearly its present aspect? These are questions which present themselves to the student of nature as he sails into the harbor of Hamilton and sees the low islands about him everywhere clothed with this peculiar tree. It was not a case of separate creation, for the idea of the old philosophers, that plants and animals were created as they now appear in the different parts of the world where they occur, is no longer tenable. Man certainly did not bring the Juniper to Bermuda, for it is not quite four hundred years yet since man first saw these islands; and it is not improbable that trees are still standing which were growing when Juan Bermudez sighted the islands which Oviedo, the first naturalist to write on the New World, and a passenger with Bermudez on his ship "La Garza," described as "the most remote of all the islands yet found in the world."

Fifty years ago these questions would not have been easy to answer. Now the light which Darwin and Hooker and Wallace and other naturalists, working on the lines laid down by Darwin, have thrown on the origin of insular floras makes it easy to find a simple and, probably, a correct solution of the presence of the Juniper on the Bermuda Islands. There is a Juniper in North America growing in nearly all parts of the continent, from Canada to Florida, and from Cape Cod to Vancouver's Island; this is our so-called Red Cedar (*Juniperus Virginiana*), a tree which, in all important respects, is very similar to the Bermuda tree. It is a well-known fact that several of our birds are very fond of the berries of the Red Cedar and devour them in large quantities. To this is due the fact that this tree is so generally scattered and multiplied through the country, as birds void the hard stone-like seeds without injuring their vitality, and so spread them far and wide. There is evidence enough that our Red Cedar was growing on this continent long before Bermuda rose above the surface of the ocean; and a bird, with his crop full of Cedar-berries, may have been blown off from the mainland and found a resting-place on the then barren coral rocks, where the seeds he had brought found conditions which favored their germination. Our continental birds, in several species, now visit Bermuda every year in considerable numbers, and this habit must have had its origin in accident. The Red Cedar once established in Bermuda, it is easy to imagine that the climate and soil conditions of its new environment would gradually change its appearance, just as all plants are gradually modified by the influences of their surroundings; and that in time, after the lapse of countless years, that it would take on its present appearance and stand for what naturalists call a species, that is, a modified or differentiated form of some other form or species. And, after all, the differences which distinguish the continental Juniper from its insular descendant are not very great. The branches of the island tree have grown stouter and tougher through their long struggles against the ocean gales; the roots have learned the secret of holding on to bare rocks or of penetrating deep into their interstices. The foliage has lost its dark green tints and is now a pale blue-gray. The leaves are blunter and are furnished on the back with a gland or resin duct. The fruit is somewhat larger, and the heart-wood is not so bright a red and is rather less fragrant than that of the Red Cedar.

An interesting thing about the Bermuda Cedar is its ability to grow apparently equally well in very different situations. It flourishes on the dry porous limestone-hills and grows as freely on the brackish swamp-lands which occur in some parts of the islands. It is not unusual to find trees of a wide geographical range, and therefore subject to different climatic surroundings, which seek to adapt themselves to them by selecting situations which in one region are at the sea-level and in others are at the top of high mountains. Many conifers which grow at the north at the sea-level are found in the south only at considerable elevations above the ocean; and the Red Cedar itself, which grows at the north on high dry uplands, inhabits, in Florida, swamps which are inundated during a considerable part of the year, and in the dry climate of the western part of the continent occurs only at high elevations. But the Bermuda Cedar grows as well in one place as it does in another, although climatic conditions do not, of course, differ perceptibly in different parts of this small group of islands.

Large individuals are no longer common; the axe of the wood-cutter and the ship-builder long ago swept them away. Here and there a venerable trunk may still be found, but among the large trees still growing on the island

very few probably are much more than a century old or are large enough to possess any great commercial value. Formerly the wood was much used in ship-building; and it is interesting to note that Henry May, an English sailor, who was wrecked on the Bermuda Islands in 1593, and who afterward printed the first account of them, escaped with his companions to the banks of Newfoundland in a vessel which they were able to make from the Cedar-wood. This same wood, twenty-seven years later, furnished the material from which Admiral Sir George Somers, who the year before had been wrecked while in command of the "Sea Adventure" on the islands, constructed the vessel which carried him to the relief of the infant colony of Virginia, and in which his body was afterward borne back to his native land. Beautiful and very lasting furniture, too, was once made on the islands from the Cedar-wood, and old cedar chests and cabinets 200 years old and more are still held as heirlooms by the descendants of some old Bermuda families who still live in houses finished with this wood, which grows with age rich and dark in color like old mahogany.

Two portraits of Bermuda Cedars are printed in this issue. That on page 274 represents the stem of a very old tree standing in the Devonshire churchyard close by the ivy-covered parish church, which resembles in architecture and surroundings one of the little churches of the older Devonshire. The tree, which recalls one of those venerable Yews of England, hoary with age, and familiar inhabitants of many an English churchyard, probably led to the selection of this particular spot as a place of worship. The tree must have been a very old and large one when the little church was built; it may well have been standing when human eyes rested on these islands for the first time, and probably it has changed very little in the last 200 years. The diameter of the trunk is now fifty-nine inches, and the height of the tree is some forty feet. Only two larger specimens are now known to exist.

The second view represents the tree as it grows in the moist black soil of the Devonshire marshes, a large tract of ground covered with Cedars of large size and springing from a dense undergrowth of Wax Myrtle, or Myrica, identical with the species so common on our Atlantic seaboard, and of Baccharis, similar to, although distinct from, our sea-board species. Tall specimens of the Bermuda Palm which, next to the Juniper, is the most interesting plant of the islands, appear here and there among the Cedars, and the ground beneath the shrubs is covered with a luxuriant growth of Ferns—with the Bracken (*Pteris aquilina*) with fronds four or five feet tall, with numerous clusters of the great Marsh Fern (*Acrosticum aureum*), and with the rare and local Devonshire Marsh Fern (*Aspidium Capense*). These marshes and their inhabitants are very beautiful, more beautiful, certainly, than any other part of the islands, and as the sunlight plays through their open glades on the pale trunks of the great trees, they offer contrasts of color and afford effects of light and shade which our picture does not convey and which words cannot paint.

## The Lynn Public Forest.

AN interesting sketch, published in a recent issue of the *Lynn Transcript*, contains much information relating to the early traditions and uses of the public woods which now form a unique pleasure-ground to that city. One of the things which surprise people visiting the Lynn woods for the first time is the rude stone walls which cross them from Wyoma and Saugus, extending in straight lines for many miles through swamps and over hills. They were built by the Puritan founders of Lynn to protect the live stock of the young settlement. To properly understand the motives which induced the great expenditure of time and labor needed in constructing these walls one must consider "the admirable economic system of land tenure which shaped the early towns. The church was the nucleus about which the planters grouped their dwellings. That the houses might be within a convenient distance from the church and from each other, and, at the same time, to foster that spirit of loyalty and independence which springs from the ownership of the soil, the Puritans threw away utterly the last traces of feudal holding of lands for services, and distributed home-lots in fee-simple. The Pilgrims at Plymouth tried at first a pure community of lands and of goods; the Puritans of Massachusetts Bay made no such mistake. They decreed every man's house as his castle in a truer sense than Englishmen had known in the Old World. Thus they established convenience to attend church and nearness to each other for safety, and the home became a sacred holding. The Puritans, however, tried the experiment of herding the stock of individuals upon commons held by the towns. This custom grew out of the Puritan reverence for that other chosen people—the children of Israel. Herding in common, but retaining individual ownership in the stock, besides being a labor-saving device, made the settlers neighborly. The early colonial ordinances teem with regulations concerning cattle, corn-fields, fences, tolling and banding of cattle, trespass by cattle and swine, damage to cattle by wolves. Cow-herds and shepherds and swine-herds became classes."

The long walls were built by the common labor of the men for the protection of their stock. The cow-pastures were nearest to the settlements because the cows had to be driven home twice every day to be milked. The horses were carefully watched, and the General Court as early as 1668 passed an ordinance directing the selectmen of towns to attend to their improvement. The Lynn horse-pasture was north of the present Pine Grove Cemetery, and was well watered by a never-failing spring, which flows as freely to-day as it did two hundred and fifty years ago. The pasture used by the early settlers for their oxen was beyond what is now Glen Louis Pond. Being farthest from the settlement, it was exposed to the ravages of wolves, which abounded in those days, and necessitated the construction of the wolf-pits, which still remain, a striking example to the ingenuity of the early settlers. The Puritans' dread of wolves was only second to their fear of witches, and in 1645 the General Court passed a law by which it was provided that the sum of ten shillings should be paid out of the county treasury "to any person, English or Indian, who shall kill a wolf within ten miles of any plantation."

The writer in the *Lynn Transcript* points out that the "Lynn woods have had three periods of usefulness. Down to 1706 they furnished pasturage and timber and shelter to the village. In their second period, covering the life of the town shifting from the pastoral to mechanical pursuits, they were still useful, although restricted to furnishing fuel to the inhabitants. As time went on, and cheap coal came in with the ever-advancing density of population, it seemed as if the slaughtering brick-maker and the fire-fiend would render the woods a desolation, a desert and a menace to our fair town."

But a period of greater usefulness has come. The inhabitants of cities require pure water, and the people of Lynn have wisely determined to protect and preserve the abundant supply which still flows from the springs which watered the cattle of the Puritans, and these woods now perform their noblest duty in furnishing the great city with water, oxygen and sylvan beauty for the repose of its inhabitants.

"The fathers, with their Aryan ways, their patient oxen and their demon wolves, have gone; the woods which were used first in common, then in severalty, the walls which testified to their energy, and the wolf-pits which note their skill in masonry, are being restored to the common inheritance of their children's children."

## Bristol Pond Bog.

TO most people the word bog does not suggest anything very inviting. On the contrary, it is considered nothing but a miry piece of ground where no one would venture, unless obliged to, and where nothing attractive can be found. This is, no doubt, a correct impression of some bogs, but we have, in New England, bogs and swamps that are as attractive, at certain seasons, in their display of natural scenery as any of the mountain forests.

In the town of Bristol, Vermont, is what is called Bristol Pond, a small sheet of water fed by mountain brooks and springs, and from which flows a lively little creek. The pond is almost surrounded by bog lands, of which there are several hundred acres, and on the east side, bordering the bog, is Hog's Back, a large foot-hill of the Green Mountains, which extends north and south for a distance of about nine miles. The pond is about a mile long by a third or half as wide, varying, of course, at different points, and very irregular in outline. The depth of the water varies from a few inches to six or ten feet, but under this lies an unfathomed body of thin, soft, peaty mud, about as thick as porridge at its surface, but probably

thicker at lower depths. The water is quite clear when not disturbed by winds, but there is a constant bubbling in warm weather from the escaping gases of the mud.

Water-lilies flourish here in the little bays, where severe winds do not disturb them; and around the margin, where the bog often projects out over the water, may be seen fine large clumps of the Swamp Loosestrife (*Nesæa verticillata*), its gracefully drooping branches resting and rooting on the surface of the water. Not only are the rose-purple flowers of this plant attractive, but its leafy recurving stems are pretty the whole season, and, for artificial bogs or the margins of ponds and streams, planted in a peaty soil, it has no substitute. Here also may be seen, flowering in its season, the Swamp or Water Rose (*Rosa Carolina*), which grows in such localities, with various other water-loving shrubs. For quite a distance back from the margin of the pond is an open bog upon which few or no trees grow, but there are low shrubs on a part of it, while other portions have only Rushes, Sedges, Pitcher-plants, and Cotton Grass. Of the latter there are three or four species. The Twig Rush (*Cladium mariscoides*) is everywhere on this open bog, and one or two species of the Beak Rush (Rhynchospora). *Dulichium spathaceum*, another queer and striking bog Sedge, also abounds, as well as other small plants that would interest the botanist. Not far back from the margin of the pond are clumps of Arrow Arum (*Peltandra Virginica*), and, scattered all over this open space, as well as back among the timbered portions of the bog, grows very abundantly the Side-saddle Flower, or Pitcher-plant (*Sarracenia purpurea*), of which the specimens here, in the full sunlight, have beautifully variegated and colored leaves, and much darker purple flowers than those in the shade. Acres of this plant in full bloom make an attractive scene. Going back from the margin of the pond upon the open bog we find, on slightly elevated portions, now and then clumps of trees—low Tamarack, Spruce and Arbor-vitæ; and clustered about them, as if planted there for a purpose, are such shrubs as the Chokeberry (*Pyrus nigra*), Swamp Fly Honeysuckle (*Lonicera oblongifolia*), Mountain Holly (*Nemopanthes Canadensis*), the Myrtle and Hoary Willows (*Salix myrtiloides* and *S. candida*), Sweet Gale (*Myrica Gale*) and many more. Sphagnum Moss, which is not found on the wetter portions of the bog, usually grows about these trees and shrubs, and in it are such low shrubby plants as the Leather Leaf (*Cassandra calyculata*), *Andromeda polifolia* and the Pale Laurel (*Kalmia glauca*). The small Moss Cranberry (*Vaccinium Oxycoccus*) often forms, with the Sphagnum, a pretty carpet, and when covered with its abundant small white or pale pink flowers in early summer, or in autumn with its speckled fruit, is very attractive. The Large or American Cranberry (*V. macrocarpon*), though it grows here also, is nowhere so abundant. The Creeping Snowberry (*Chiogenes hispidula*), where it can find a little shade, is also abundant, and forms thick mats of its creeping stems and small dark evergreen leaves. Large overgrown clumps of the Stemless Lady's-slipper (*Cypripedium acaule*) are sometimes found here growing in the Sphagnum.

As we go farther back into the timbered portion we come among more Tamarack, Arbor-vitæ and Spruce, so that, though they do not completely cover the bog, they have hidden the pond from our view. Here in the half-open spaces, where the ground is higher, and is completely covered with moss, may be found in their seasons a wealth of flowers. *Arethusa bulbosa* is so abundant in certain localities that one might sit in the soft moss and gather a score of plants without moving. It varies in height from the little dwarf which rises an inch or two above the moss to the strong plants fifteen or twenty inches high. The Bog Shinleaf (*Pyrola rotundifolia*, var. *uliginosa*), which grows and blooms with the Arethusa, is a charming companion to it, has roundish shiny leaves and handsome purple or flesh-colored flowers. The Sarracenia and Stemless Lady's-slipper are also here, and one of the white-flowered Rein Orchis (*Habenaria dilatata*), with handsome spikes of fragrant pearly white flowers. *Calopogon pulchellus* is scattered about everywhere, as is also, though not quite so abundant, *Pogonia ophioglossoides*. Other less showy Orchids are growing in scattered groups not far away, such as *Habenaria hyperborea*, *H. tridenta*, *Listera cordata* and *Microstylis ophioglossoides*. The Bog Bean (*Menyanthes trifoliata*) is quite common in places, and the handsome racemes of its dainty white flowers are among the earliest of the bog. *Smilacina stellata* and *S. trifolia* are both common here, and add much to the floral display. The little Ram's-head Lady's-slipper (*Cypripedium arietinum*) also grows a little farther back in more favored situations; and in other places the small yellow Lady's-slipper (*Cypripedium parviflorum*) is quite abundant, and not rarely in clumps of a dozen stalks. At each step we sink ankle-deep in the cool soft Sphagnum, and as we turn back and see our footprints they reproach us as if we had ventured on sacred ground.

Walking at random, and with no definite course, through this botanical paradise, new attractions greet us at every turn. Farther back out of the locality of Sphagnum we find large patches of the Twin-flower (*Linnæa borealis*), which is one of our most attractive little vines when in flower. The Water Arum, or Wild Calla (*Calla palustris*), is also found here, and, though not abundant, the showy Lady's-slipper (*Cypripedium spectabile*) is frequently seen. Under some of the large thick clumps of Arbor-vitæ, where only a thin sifting of sunlight ever reaches it, is one of our most delicate and charming little Orchids, *Orchis rotundifolia*, with pale rose-purple flowers. Even the *Calypso borealis* is not a stranger to this bog, for it has been found here in the drier portions under the largest specimens of Arbor-vitæ. Around some portions of the bog's margin the Black Ash extends into the bog or peaty ground for some distance. Other portions are thickly covered with low trees or tall shrubs. Still others have such a dense growth of Arbor-vitæ that nothing can live under them. But in some places, where the evergreens are scattered with wide spaces of Sphagnum Moss between, may be found some sylvan scenes as rich as any our forests afford.

Botanical Garden, St. Louis, Mo. *F. H. Horsford.*

## How We Renewed an Old Place.

### X.—A STRUGGLE WITH THE WEB-WORM.

AMONG the difficulties of reclaiming a place, one cannot ignore the necessary hand-to-hand conflict with the various animal and vegetable enemies which lie in wait to destroy plants and trees. Eternal vigilance is the price of vegetation as well as of liberty, and the cultivator who dreams that he can for a moment take his ease in his inn, reckons without his guests of the insect-world, who take short naps, and require as much nourishment as Falstaff. I shall have more to say upon this subject at a later date, but I am now fresh from a conflict with the Web-worm, and find a treatise upon his manners and customs apropos. As an example of pertinacity, Bruce's spider beside him pales her ineffectual fires; as an evidence of the apathetic stupidity of man he is unrivaled, and as a menace of future untold horrors he may well be used to point a moral of grewsome interest.

Some philosopher has said that "the real end of the world will come when man ceases to be able to cope with the insects." When his time comes the worm is the master of us all, but there is no reason while we are yet stirring about this earthly ball that we need submit to be devoured by him before our day. And yet, when you come to think of it, that is what the brute is after. Too cowardly to attack man openly, he begins by eating up his provender. Man, being on the whole an easy-going animal, at first pays not much attention; but he only multiplies moderately, and the insect enormously. Where a man will leave a half-dozen descendants in a life-time a worm will leave one hundred and twenty-five thousand in a season; judge then if this can be allowed to go on indefinitely and man survive!

Where the inane apathy of the human being comes in is in not crushing his enemy while yet insignificant; forever penny wise and pound foolish, man tolerates a moderate evil until it becomes inordinate, and then wastes a fortune which might well have been saved, in doing ineffectual battle with his foe. It is the fable of Epimetheus forever renewed, and the appeal I would now make is to have this Pandora's box closed before the rest of the Web-worms escape to plague the world, and help make an end of the race.

It is idle to scoff at this idea as that of an alarmist. A few years ago the spring Web-worm was an unimportant factor in our orchards. The fall worm gave some trouble, but he was not impossible to cope with. Now, not only do we have to fight for every apple we possess in the autumn, but all through the months of April and May, when work presses, when every moment is precious, it takes not only all the hands on a farm to fight caterpillars, but also all the eyes of the family to detect their lurking-places; and this not as one job, but as a perpetually recurring duty for weeks at a time, and all on account of the crying neglect by land-owners of their premises, and by town authorities of the webs on their own highways, which have been allowed to accumulate, until the country roads have lost their beauty, lined as they are with trees shrouded from root to summit in ghostly webs, under which myriads of loathsome black worms writhe and crawl, and eat their fill, to the shuddering disgust of the wayfarer.

Far and near, not only are the wild Cherry-trees, already infested with the odious black knot, left to spread a second plague among the fruit-trees, but whole orchards are allowed to bear, unmolested, swarms of caterpillars, their owners preferring to sacrifice their apples rather than take the trouble to clean their trees of the webs.

If the state of Massachusetts has taken the Gypsy Moth in hand, why should not communities take charge of their own worms and enforce the destruction of the webs by each landowner, under penalty of a fine, while the street commissioners be made to attend to the trees bordering the highway?

The farmers who neglect this rapidly increasing nuisance seem to me like the Turk who sits under a crumbling wall, murmuring, "God is great! if it falls it falls!" and takes no pains to get out of the way.

So far as our own little farm is concerned, some tall wild Cherry-trees that we depend on for a screen give us timely notice of the arrival of the pest, and bring us all out promptly to do battle. The worms are fought with fire on the end of a pole, with a tall clipping knife, and with a wire brush attached to the end of a long bamboo rod which reaches to the very top of the tallest trees, where, being judiciously twisted, it brings down a crop of crawlers for more positive destruction below. The clipping is the most thorough method, for, if done late in the evening, the nest, with all its occupants, can be secured and its contents burned or trampled to death. In this way all the insects can be destroyed, but, of course, it is only possible where the web is on the end of a small branch. Where it lies in the great crotches the torch or the wire brush must be applied, but the former lets some escape, and I am told that when the nests are burned, the fire shrivels the outside of the crawling mass, which falls with the web to the ground, but the caterpillars in the heart of the living ball escape, to crawl up the tree again and start afresh upon their depredations.

It is of no use to think that you have accomplished your purpose because, after heroic labor, there seems not a vestige of a nest remaining. No sooner do you feel that you have routed the last encampment of the enemy than, presto, his tents are once more like those of the Assyrian for multitude, and in a day or two you must resume your round to find the enemy bigger and brisker than ever. About three months of the season have to be given up to the two campaigns, spring and fall, till finally a person of imagination begins to feel that the philosopher's prediction is about to be fulfilled, and that the worm has come to stay.

"Of what use are the Cherry-trees?" say the wise; "the worm, after all, is not so bad as the black knot, and compared to the canker-worm he is harmless"; but the terror of his multiplication is upon me, and I live in fear of the day when, having ruined all the fruit-trees, and having failed to find the shade-trees to his liking, the worm may take a fancy to investigate within-doors to find a more tempting meal.

A vision of opening the front door in the morning to find the house encased in an enormous web, under which the worms are feeding on the shingles, and glaring at you from under their silken canopy, besets the imagination. You seize your hat, a brisk young family drops out of it; your coat—there are a score of creeping things inside the sleeves. The breakfast-table is invaded by a squirming throng; others hang from the draperies and wander across the ceilings. Why may not the Web-worms become as great a pest to us as the Termites prove to the South African, if the apathetic public does not awake in time to the necessity of destroying them while they are yet in the minority?

Here in this town, where the neglect of certain farmers adds so greatly to the labors of their more thrifty neighbors, we have seen these loathsome creatures multiply in a few years to an alarming extent, and it seems as if the time had come to render it a penal offense to neglect to destroy the webs as fast as they appear. Unquestionably, the day is coming when some destructive measures will have to be adopted, and the sooner the matter is taken in hand the easier it will be for all concerned to get rid of the evil, and I should be glad if some more powerful pen than mine could be used to hurry this good end.

An evil, trifling in itself, becomes a menace if neglected, and the comparatively inoffensive character of this little brute seems to blind the public to the way in which he is multiplying. A committee to find out how much harm he does might serve as a preliminary to more strenuous measures, but if it were only in the interest of those lovely rustic roads, in which Garden and Forest takes so much delight, it would be worth while to clear away so obtrusive an eyesore as these loathsome webs from the way-sides, otherwise so beautiful with their wild vines and tangle of bushes.

Moreover, for the pedestrian the multiplication of caterpillars is a distress yearly more and more appalling. After the worm has eaten his fill he sets forth upon his peregrinations, to find a sheltered spot where he can become a hermit in a cell, until such time as his resurrection as a moth is in order, and you are obliged to meet him on his winding way at every turn in your path. Country sidewalks swarm with the wretches; verandas are their especial delight; you gather a flower, a caterpillar is crawling up the stem; examine your trees of all sorts, the brutes are making of their trunks a public promenade, up which they hurry at top speed to make a cocoon in the branches; would you rest yourself upon a bench, the caterpillar is there before you; if you wear a thin gown, you may have the pleasure of viewing through its meshes the wriggling, hairy form of your enemy, just where you cannot get at him. He makes himself at home amid the flowers of your bonnet, he swings down upon a silken thread within an inch of your nose. He arouses in the gentlest breast a desire to slay this future parent of thousands; he undermines the character by stirring up sentiments of virulent hostility in otherwise peaceable souls; he becomes a menace not only to existence, but to Christian character, by developing the savage instincts of our nature; and, therefore, on every ground, both physical and moral, he is an enemy of the public peace who should be taken in hand by the authorities and be doomed to extermination.

Hingham, Mass. *M. C. Robbins.*

Note.—The editor of this periodical requests me to provide my enemy with a more precise name than Web-worm. Not being learned in entomology, the only term I dare to vouch for is *Nasticrechia Krorluppia* (to be pronounced English fashion).

To this family I am entirely sure he belongs, but one of the reports of the Department of Agriculture has a good deal to say about a certain *Hyphantria cunea*, which seems to correspond to him in most particulars, and the same report furnishes for him ten more synonymous names that apparently can be used if necessary. From this abundance I have selected the above as the most euphonious and descriptive, for nothing could be more appropriate than the term Shameless Weaver, which, I am told, is the translation of these polysyllables. Should my particular Web-worm require a more formal introduction to the public, it is to be hoped that some entomologist will kindly supply us with his real designation.

## New or Little-known Plants.

### New Orchids.

Cirrhopetalum elegantulum, Rolfe, is an elegant and floriferous little species, native of the Coorg Hills, south India, which was sent to Kew by Mr. J. O'Brien, of Harrow. It is allied to *C. pumilio*, Hook., f., a native of Burma. The lateral sepals are yellow, except in their basal portion, which, like the rest of the flower, is striped with maroon-purple on a pale ground.—*Gardeners' Chronicle*, May 2d, p. 332.

Masdevallia × falcata, O'Brien, is a showy garden-hybrid raised by Mr. D. O. Drewett, of Riding Mill-on-Tyne, from *M. Lindeni*, crossed with the pollen of *M. Veitchii*, to which latter it bears a considerable resemblance, especially in color. It may be compared to *M.* × *Chelsoni* in its general characters.—*Gardeners' Chronicle*, May 2d, p. 332.

Epidendrum × dellense, O'Brien, is a pretty hybrid raised in the celebrated collection of Baron Schröder, of The Dell, Egham, between *E. xanthinum* and *E. radicans*, the latter being the pollen parent. It bears a considerable resemblance to the mother plant, except in color, which is a shade of orange approaching vermilion. The flowers, however, are larger, and there is a slight curvature in the column which bespeaks the influence of *E. radicans*.—*Gardeners' Chronicle*, May 9th, p. 584.

Sobralia macrantha delicata, O'Brien, is a pale, nearly white, variety, with a tinge of lavender on the sepals and petals, and lilac on the margin of the lip, and without any yellow on the throat. It flowered with F. A. Bevan, Esq., of New Barnet, from an importation of Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, May 9th, p. 585.

Cirrhopetalum Wendlandianum, Kränzlin, is a remarkable species, native of British Burma, which flowered in the collection of Herr Wendland, of Herrenhausen, near Hanover. It bears an umbel of three to six flowers, colored in the way of the old *C. auratum*. The sepals are ovate, with long hairs on the margin, and with five or six fluttering serrulate leaflets at the top, almost as long as the sepals, and deep

claret-red in color. The petals are ovate at the base, protracted into tails from six to seven inches in length, longer than the pedicel itself. They are yellow, striped with purple in color, as also are the sepals, while the lip and column are purplish, with deep red spots. It is a very remarkable species.—*Gardeners' Chronicle*, May 16th, p. 612.

CIRRHOPETALUM COLLETTII, Hemsley, is a beautiful species, originally described from dried specimens, but now flowering, for the first time in Europe, in the Kew collection. It is nearly allied to *C. ornatissimum*, but has larger flowers, and is probably the finest species in the genus. It grows on the Shan Hills, in eastern Burma, at an altitude of 6,000 feet. The flowers are striped with reddish purple on a lighter ground. The upper sepal is adorned with numerous linear appendages on the margin, and the apex of the petals with several slender leaf-like bodies, which flutter in a singular manner with the slightest breath of wind, and probably serve to attract insects for the fertilization of the flowers.—*Gardeners' Chronicle*, May 16th, p. 614.

Kew. *R. A. Rolfe.*

## Foreign Correspondence.

### Some New Plants in England.

PRIMULA POISSONI, Franchet.—This is a beautiful plant, for which we are indebted in the first instance to L'Abbé Delavay, who discovered it along with many other good garden-plants in Yun-nan, and forwarded seeds to the Jardin des Plantes, Paris, to which establishment we are indebted for several of the seedlings which are now in flower at Kew. In stature and general appearance *P. Poissoni* is similar to the popular *P. Japonica*, but it differs from that species in the smaller, more fleshy, glaucous, smooth character of its foliage, and in the color and several minor details of its flowers. The plant forms a dense tuft of leaves, each of which is six inches long by from one and a half to two inches wide, and the scape is erect, stout, as in *P. Japonica*, with the flowers in whorls and opening in succession. Each flower is as large as those of the best forms of *P. Japonica*, and colored bright rosy mauve, with a conspicuous eye-like ring of yellow around the apex of the tube of the corolla. The segments are obovate and notched, and in the Kew plants every flower has either six or seven segments. A description of this species occurs along with others in the *Bulletin de la Société Botanique de France* for 1887, which contains a paper by Franchet on the Primulas of China and Tibet.

P. IMPERIALIS, Jungh.—This is the giant Primrose of the high mountains of Java, which De Vriese described as a new genus under the name of *Cankrienia chrysantha*, and which Wallace mentions in his delightful book, "The Malay Archipelago."

In 1884 Sir Joseph Hooker referred this plant to the Himalayan *P. prolifera*, a smaller, and in every way much inferior, plant from the point of view of the horticulturist. The two may be specifically identical, but there is a great difference between the Himalayan form as represented in the *Botanical Magazine*, t. 6732, and the Javanese giant as represented by a batch of plants now in bloom in a cold frame at Kew. Picture a plant like *P. Japonica* in habit, but with leaves fifteen inches long by five inches in width, and a scape as thick as a man's little finger, bearing whorls of deep yellow flowers almost as large as those of *P. Japonica*. The scapes on the Kew plants are already two feet high, although only the first whorl of flowers has expanded, and there are five or six to come in all. As the largest Primula known, this species, or rather the Java form, has a special interest, but it also possesses beauty in its deep yellow flowers, while looking at it as the probable progenitor of a race of garden-plants—for it may be considered to have all the capabilities of its ally, *P. Japonica*—it must have a decided value for the breeder and cultivator. It has crossed freely with *P. Japonica*; at any rate, there are some plump, promising-looking pods of hybrid seeds on some plants at Kew.

The following plants were among those which obtained certificates at the exhibition held in the Temple Gardens last week:

EREMURUS HIMALAICUS.—Several flower-spikes of this plant were exhibited from a garden in Ireland, where apparently these stately Indian Asphodels find congenial quarters. Mr. Gumbleton, of Cork, I believe, was the first to flower the above-named species, having raised it from seeds collected in the Punjaub, where it is said to produce flower-spikes eight feet high. Mr. Gumbleton's plants were five feet high. How high those exhibited had been I could not ascertain, but only the flower-bearing portion of the spike was sent, and this was exceedingly beautiful, being a compact tall pyramid, two feet high, of pure white flowers with golden stamens. The cultivation of these plants requires some care. They prefer a well-drained soil and a sunny position. The crowns, too, should stand a few inches above the level ground. *E. robustus* is another tall and handsome species which is sometimes to be seen in English gardens.

COCOS PYNÆRTI.—This is a seedling variety of *C. Weddelliana* which came up among a batch of seedlings of the latter in the nursery of Monsieur Pynaert Van Gurt, of Ghent, after whom it has been named by Mr. Sander, who obtained a first-class certificate for it from the Royal Horticultural Society. A figure and description of it will be found in *Revue de l'Horticulture Belge* for April last (p. 91), where it is named *C. minima pulchra*, a name, by the way, so far accepted as to have obtained the notice and certificate of the Horticultural Society of Ghent. The plant is very elegant, owing to the narrowness of the pinnæ, which are scarcely half as wide as those of the ordinary *C. Weddelliana*. The Sanderian specimen is unique, so far as I can learn, and, as the plant cannot be propagated, it must necessarily remain so.

GRAMMATOPHYLLUM MEASURESIANUM.—This was the most interesting Orchid at the exhibition. It was introduced from the Philippines by Mr. Sander about two years ago, and distributed under the above provisional name. A description of it will be found in GARDEN AND FOREST (ii., 524). The first plant to bloom was that exhibited by Mr. Sander, and, as a matter of course, it was awarded a first-class certificate. Whether it differs from *G. Fenzlianum* or not I am not at present able to decide; but, whatever its correct name may be, it must take rank among the best of tropical garden Orchids. Apparently, it has the same shy flowering character which is the only drawback to the popularity of the other two species in cultivation, namely, *G. Ellisii* and *G. speciosum*. The plant certificated was a grand mass, bearing four erect spikes about five feet long, branched and clothed with numerous flowers, each three inches across; the sepals and petals equal, wavy, half an inch wide, spreading, the tips recurved; lip small, with the sides overlapping and enfolding the column, the tip of which was revealed by the bending down of the tongue-like middle lobe. The color of the whole flower was greenish yellow spotted with reddish brown, the central lobe of the lip being white lined with crimson, the lateral lobes lined with brown.

CATTLEYA PRINCE OF WALES.—This is a new hybrid raised by Mr. Sander from *C. Mossiæ*, var. and *C. elegans*, or some such combination. It is in the way of the last named, but smaller, with waxy-white sepals and petals, the lips also white, with rosy veins and a wavy margin.

C. LOWRYANA, from the last-named exhibitor, is supposed to be the result of crossing *C. intermedia* and *C. Forbesii*. It resembles the former in the size and shape of its flowers, which are white, with a purple or mauve tint on the front lobe of the labellum.

MASDEVALLIA MUNDYANA is the handsomest hybrid Masdevallia hitherto raised. It is the result of crossing *M. Veitchii* and *Mignea aurantiaca*, combining the chief characteristics of the two in a peculiarly pleasing manner. The flowers are almost as large as those of *M. Veitchii*, their color being orange, changing to scarlet toward the lower part of the sepals. It obtained a first-class certificate.

ÆRIDES SAVAGEANUM, as shown in several of the groups, was quite worthy of the first-class certificate awarded it. There are, however, many plants of it in cultivation which are a long way inferior, in the size and color of the flowers, to those shown. Mr. Sander thinks this species has not yet been seen at its best. It has elegant loose racemes of rather small but bright crimson-colored flowers.

ONCIDIUM LOXENSE.—This distinct and noble species was named by Lindley about forty years ago from a specimen collected by Hartweg on the Cordillera, near Loxa, in Peru, where it is said to produce "flower-panicles nine feet long, the flowers as in *O. falcipetalum*." In 1884 Reichenbach notices it in the *Gardeners' Chronicle*, in consequence of Mr. Sander having forwarded to him specimens and a drawing, but living flowers of it do not appear to have been seen in England until they were shown on a plant at the Temple last week. This plant has oblong compressed pseudo-bulbs, broad, somewhat rigid, leaves, and a spike five feet long bearing numerous flowers as large as those of *O. macranthum*, but differing from all other plants of the Microchila section in the size and form of its labellum, which resembles the lip of the African *Lissochilus Krebsii* in form and color. The sepals and petals are brown, with irregular blotches of yellowish green, and the lip is deep yellow. A batch of plants of this species was sold by auction in London in 1884.

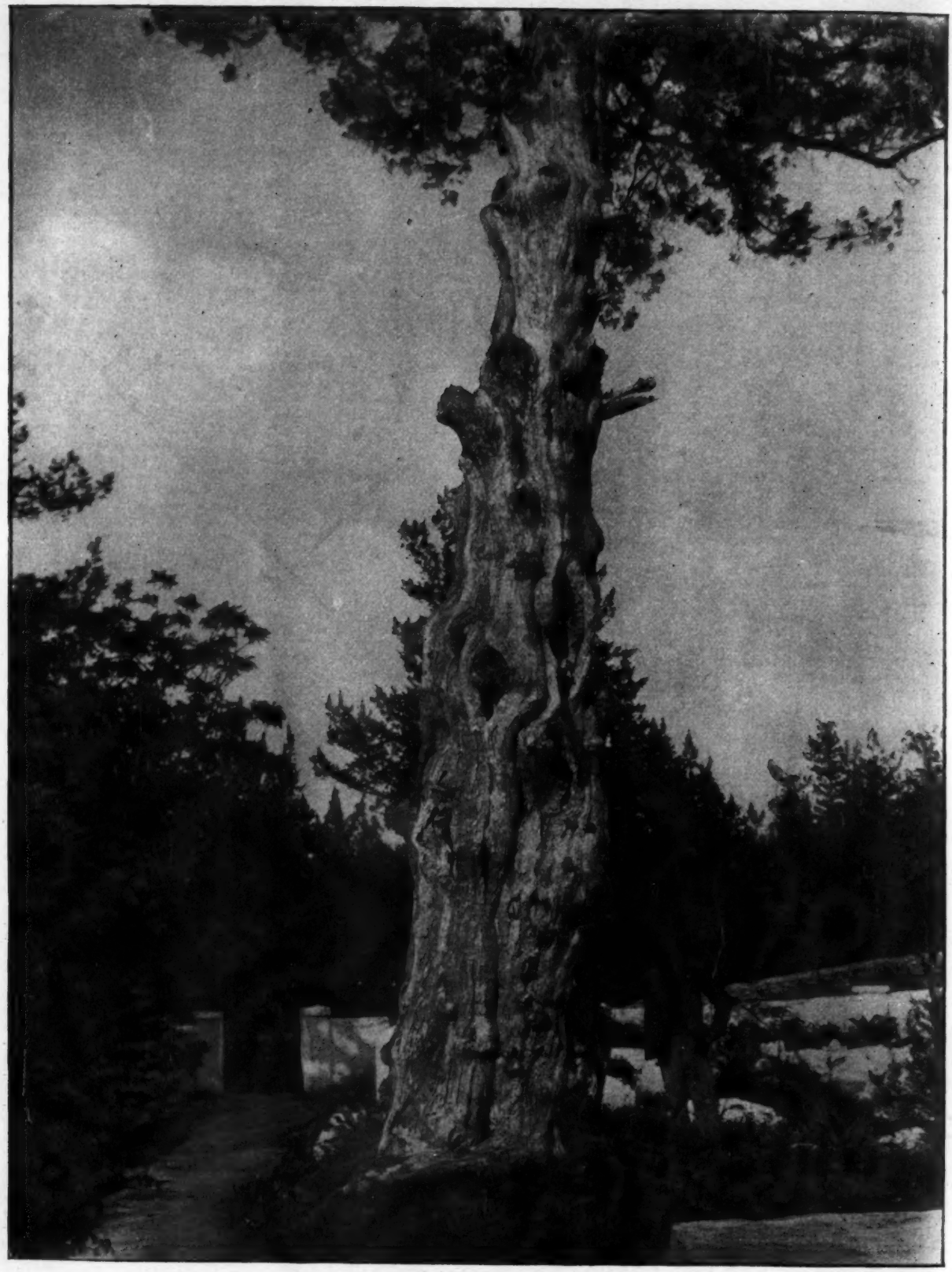

Fig. 51.—Old Cedar in Devonshire Churchyard, Bermuda.—See page 289.

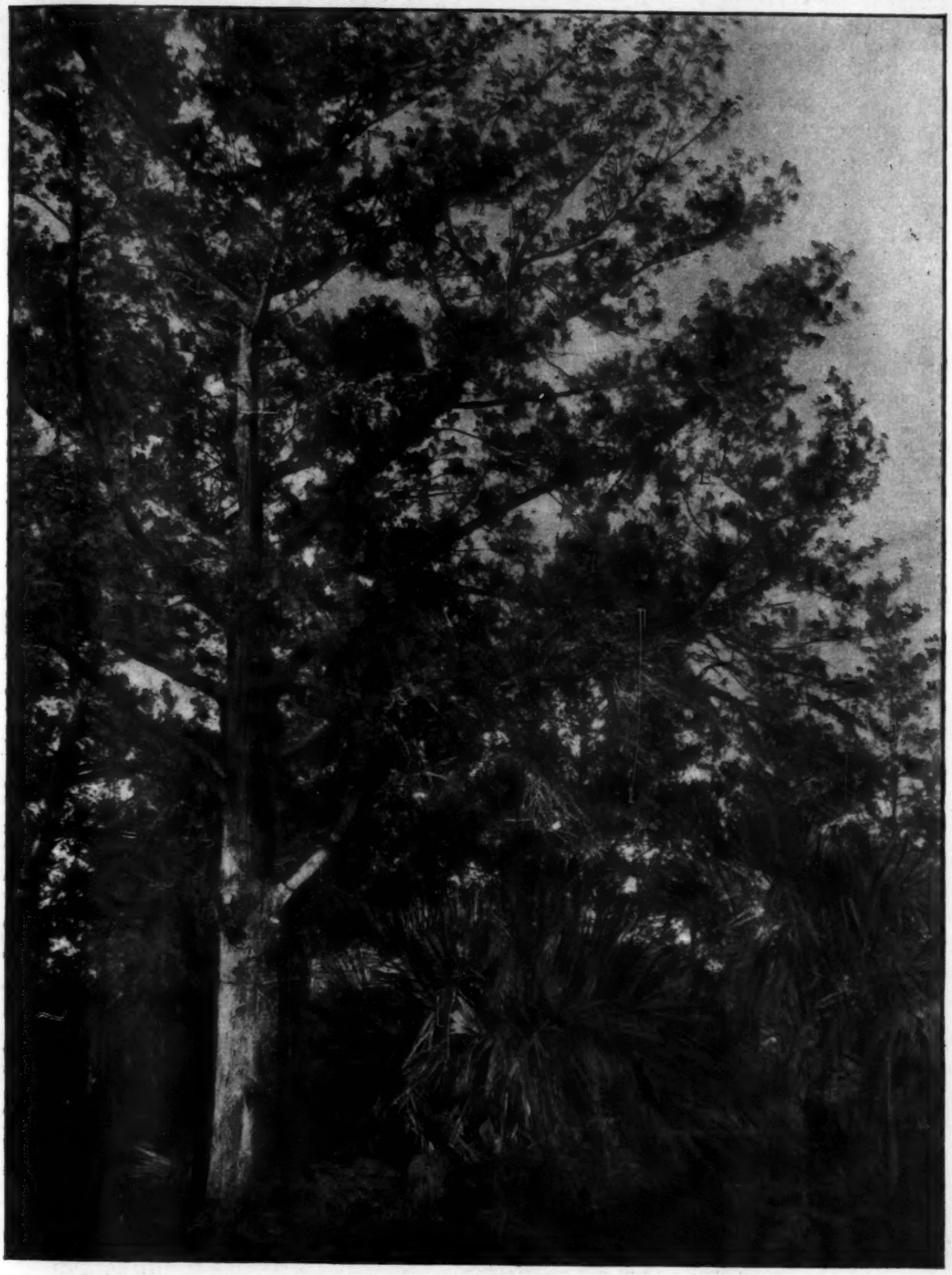

Fig. 52.—Juniperus Bermudiana in the Devonshire Marshes, Bermuda.—See page 289.

Other Orchids which were especially recognized by the Society were *Lælia elegans Statteriana*, white, with a large labellum veined with crimson, on a creamy-white ground; *Cypripedium Stonei magnificum; Dendrobium Parishii albens*, a variety with pale lilac flowers; *Masdevallia Harryana luteo-oculata*, large richly colored flowers with a distinct yellow eye; *Odontoglossum elegans Sanderæ*, which is a most beautifully and heavily marked variety of one of the very finest Odontoglossums; *O. Amesianum;* and several hybrid Cypripediums.

Kew. *W. Watson.*

## Cultural Department.

### Stray Notes from the Arnold Arboretum.

MANY of the plants which will be mentioned in these notes have already been noticed in the columns of Garden and Forest, and several of them have been figured and described in detail. A longer test in this severe climate, however, brings out the good qualities and emphasizes the value of plants known in cultivation for a few years only or shows their weaknesses or bad qualities, and a few additional facts relating to them may be useful to planters.

Too much cannot be said, certainly, in praise of the native shrubs of eastern America for the decoration of the gardens and shrubberies of the region which they inhabit naturally. Our native Viburnums and Cornels are all plants of beauty and value. The natural shrubberies made several years ago in the Arboretum with these plants show their beauty and value where shrub-planting on a large scale is desirable. Many of the species are not less valuable as single specimens than when grouped in broad masses on the borders of natural woods or of wood-drives. The example set by the Arboretum in utilizing our native plants and in developing their beauties is beginning to bear good fruit, and there is now a demand for plants of this class which none of the nurserymen are enterprising enough to be able to fill at all satisfactorily. There is no difficulty, however, in getting up a stock of any of our native plants; they can, of course, all be raised from seed, and the seed is not difficult to procure in large quantities if any one knowing the plants will take the trouble to go out into the woods and gather it. Young seedling plants, too, can generally be found in abundance in the woods, and, with proper care, these can soon be grown into good specimens. But people do not always take proper care in such cases; and purchasers are apt to think that because plants grow naturally in the woods that they ought not to cost anything but the trouble of digging them. The result has been that nurserymen who have attempted to fill large orders for these plants have generally been forced to offer them at prices which do not allow them to supply proper plants.

The only way to be sure of succeeding with shrubs or trees dug from the woods is to select only small thrifty specimens—those which are only a few inches high are the best—then to plant them in nursery rows in good soil and to cultivate them for one and perhaps for two years. Plants treated in this way become stout and stocky and are supplied with abundant roots, and, transplanted to their permanent places, are certain to succeed and to grow rapidly as soon as transplanted. Such plants are worth at least four times as much money as the native plants usually sold and planted. These are generally dug in the autumn, the largest plants possible being selected, so as to make a good show and satisfy the purchaser who habitually wants "something big to make a show at once, as life is too short to plant little sticks"; the plants are then roughly heeled-in over winter and delivered in the spring with scanty roots and big tops, and usually more dead than alive. Of course, more than three-quarters of such plants die, and the purchaser is discouraged and believes that it is no use trying to make wild plants grow, and goes back to the conventional nursery-grown Golden Spiræas and Golden Elders, purple-leaved Plums, and all the other so-called novelties with which the tree-peddler beguiles the unwary. It costs just as much money and labor to prepare the ground for a bad plant as it does for a good one, and just as much to plant it. It is wretched economy, therefore, to plant cheap trees or cheap shrubs; they need not be large—generally the smaller they are when planted the better—but they should be provided with an abundant supply of active healthy roots. Good soil and good cultivation are needed to produce good roots and make plants which can be transplanted without risk of loss.

But to return to our native Viburnums and Cornels. The largest of the Viburnums, which grow in New England, and one of the handsomest of the whole genus, is the so-called Sheep-berry (*Viburnum Lentago*). This sometimes attains the size of a small tree, but is more often only a shrub. If it is planted by itself in good soil as a specimen on the lawn it will grow into a large round bush perhaps fifteen feet high and ten or fifteen feet through the branches, which will rest on the grass. The leaves are large and beautifully shining and lustrous, and the large flat clusters of small creamy white flowers are produced during the first days of June in the greatest profusion, and in autumn are followed by bunches of handsome blue-black oblong edible fruit. A well-grown and symmetrical specimen of this plant is an object of great beauty; there is hardly another shrub which can be grown into a more perfect specimen; and if the Sheep-berry came from Tibet or Yun-nan, or from the summit of an equatorial African mountain, and cost fifty pounds an inch, rich Americans would soon exhaust the supply. Now the sight of it only fills most people with surprise and a profound disbelief that such a handsome plant can grow by the roadsides and in the coppices of every New England village, for it is this species which is the chief ornament of our roadsides in early summer. *Viburnum Lentago* has been largely planted in the Arboretum, and has proved valuable in all the situations where it has been tried. It flourishes in the shade and in the full sunlight, and requires strong, rich soil and abundant space if it is to be allowed to spread to its full dimensions.

The nearest species botanically to *Viburnum Lentago* is the so-called Black Haw (*Viburnum prunifolium*). This plant does not grow in New England, although it is hardy here. It is very common in the middle and southern states, and abounds in Central Park, in New York, where there are many fine specimens in the wilder wooded parts, which are made beautiful by them in early May, when the plants are in flower. This species grows to be a larger tree than *Viburnum Lentago*, and the flowers, which are more nearly white than those of that species, are decidedly handsomer; the fruit, too, is more showy. The leaves, however, are narrower and less lustrous, and, on the whole, except when it is in flower, the southern plant is less beautiful than its northern relative.

*Viburnum dentatum*, or Arrow-wood, is as beautiful almost as either. It is a shrub ten or fifteen feet high, which grows in rather moist soil near streams and swamps all over the northern states, and has broad lustrous leaves with large sharp teeth and very prominent veins, and produces large flat clusters of nearly white flowers. The fruit, which ripens in the early autumn, is bright blue and very ornamental. This is an excellent plant in cultivation; planted in deep well-manured soil it grows with a vigor unknown to the wild plant and produces larger and richer-colored leaves and larger and more abundant clusters of flowers. Few plants better repay good cultivation, and there are very few shrubs of any country which are more ornamental in cultivation or better worth a conspicuous place in the shrubbery.

*Viburnum pubescens* is a smaller plant than *Viburnum dentatum*. The leaves are smaller, narrower and more sharply pointed, and the flower-clusters are much smaller. It rarely grows more than three or four feet high by as much broad. The flowers, which appear rather earlier than those of *Viburnum dentatum*, or during the first days of June, are produced in the greatest profusion, and quite cover the plants when they are grown in good soil and allowed an abundance of light and air. This is one of the best shrubs to plant on the outer margin of a large shrubbery, and it is particularly beautiful in the autumn, when the leaves turn a rich dark purple color like that of some old Spanish leather, a most unusual color among our plants. This adds greatly to the value of *Viburnum pubescens* as an ornamental plant, and makes its cultivation particularly desirable.

Delightful, too, is *Viburnum acerifolium*, the familiar Arrow-wood of eastern woods. This is a small plant with slender stems, which rarely rise to a greater height than three or four feet, and Maple-shaped leaves, which in the autumn turn a most beautiful scarlet color. The flower-clusters are not broad, but they stand up well on the ends of the branches, and the individual flowers when they expand are bright pink, and later become creamy white. The showy black fruit remains on the branches through the winter. This is naturally a shade-loving plant, and thrives when planted under shrubs and other trees; it bears the sun, however, and apparently grows as well when fully exposed to it as it does in its native glades.

Our two native Viburnums, with nearly entire bright green leaves with obscure veins and long-stalked flower-clusters, are plants for the garden. These are *Viburnum cassinoides* and *Viburnum nudum*. No one seeing these plants cultivated for the first time can be made to believe they are common native plants. In their swamps they grow up tall and spindling, but, transplanted to good soil, and given sufficient space to spread,

they form broad, round masses of large, handsome foliage, larger, and almost as beautiful as that of the Camellia, and, in June, cover themselves with great broad clusters of creamy white flowers. Naturally they inhabit swamps, but they seem to grow better in good, well-drained soil. *Viburnum cassinoides* is a more northern plant, and flowers rather earlier than *Viburnum nudum*, a native of the region from New Jersey to Florida. Both are equally hardy here, and there is little to choose between them as garden ornaments, although the leaves of the southern species are thicker and rather more lustrous than those of its northern relative. No one will make a mistake in planting either of them or in giving them a conspicuous place in any garden, however carefully selected its contents may be.

The Cranberry-tree (*Viburnum Opulus*), the wild form of the familiar Snowball-bush, is now so well known and so commonly planted that another notice of it does not seem necessary. It occurs in all the three northern hemispheres; and it is, perhaps, worth recording that there are now growing in the Arboretum plants raised from seed sent from northern China, which are much more ornamental in flower than either the North American or the European forms; the sterile ray flowers, being twice as large, and rather more than an inch across, while the anthers, instead of being green, are bright purple. The plants are perfectly hardy, and this variety should be better known and generally planted.

But the most beautiful of all the American Viburnums, so far as concerns the flowers, is the Hobble-bush (*V. lantanoides*), figured in GARDEN AND FOREST (Vol. ii., p. 535, f. 141). It produces, like *Viburnum Opulus*, neutral ray flowers around the outside of the cymes, and these are very large and pure white. The leaves are broad and thick, and, in the autumn, turn to a brilliant scarlet color. Naturally this plant grows under the dense shade of trees in the northern forests, which it cheers in early spring with its great clusters of flowers, and again in autumn with the bright colors of its leaves. It is a difficult plant to cultivate, and we have heard of a single instance only where, brought into the garden from the woods, it has been made to grow successfully. Mr. Dawson has found that, grafted on the European *Viburnum Lantana*, it grows stronger and more vigorously than it does on its own roots, and his stock of grafted plants now gives promise of ultimate success. It is such a beautiful plant, and one so well suited to flourish under the shade of trees, that serious efforts to get it established are well worth making.

Arnold Arboretum. *P. C.*

## Some Early Spiræas.

FROM several causes the Spiræas have not done so well at the Arboretum this season as usual. Some were injured in winter, but the most damage was done by frosts in the first week of May and again about the 18th or 19th, when a great many buds were very much hurt. This frost apparently affected the buds of the hardiest as well as the more tender of the early-flowering species.

*Spiræa pubescens*, of which an illustration appeared on page 331 of the first volume of GARDEN AND FOREST, proved something of a disappointment this season. In a series of perhaps a dozen plants the blossoms were uniformly straggling and few, and the numerous naked stems and branches plainly showed that the plants were either all equally injured during the past winter, although planted in different exposures, or it may be that they are short-lived and degenerate after a certain period. The plants under notice were raised from seed collected by Dr. E. Bretschneider in the mountains near Pekin, China, and sown at the Arboretum in the beginning of the year 1883. Whatever may have been the cause of its present unsatisfactory condition, *S. pubescens* is well worth cultivation and frequent propagation on account of the earliness of its blossoms. These resemble the more common species known as *S. trilobata*, or the improved form known in gardens as *S. Van Houttei*, but they are of especial value because they appear two or three weeks before the flowers of the others. The blossoms are of about the same size, and are borne in similar clusters as in the two already mentioned. The foliage is of a light green color, and the young shoots and the under sides of the leaves are quite densely pubescent or downy.

As already stated, this is one of the earliest-flowering species, but it is not so early as *S. Thunbergii*, which ranks as the very earliest of the hardy species in cultivation here. Its value lies not so much in the abundant white, early spring flowers, by which its branchlets are covered, as in the fact that the fine soft foliage makes the plant a pleasing and ornamental object throughout the season, and in the brilliancy of its foliage in late autumn it is not equaled by any other species in the genus. It is scarcely surpassed by any other hardy shrub in its autumn coloring, and it has the great merit of holding its leaves until very late in the season.

The old-fashioned double-flowered *S. prunifolia* closely follows *S. Thunbergii* in its blossoming. Like many others, the plants of this species have a bare and straggling appearance as they grow tall and old. They grow easily and rapidly, and better results in bloom will be obtained if old stocks are occasionally removed and new shoots put in their place. *S. prunifolia* is usually fairly hardy here, although the tips of the branches are often winter-killed. What has been called the single-flowered type of this plant was received at the Arboretum several years ago, but it has been so much injured every winter that it has not been possible to get any idea of its normal growth and appearance. The few blossoms which have developed in early spring, through careful winter protection, have shown much likeness to those of *S. Thunbergii*.

In small gardens, where only a limited number of plants can be grown, there is probably no Spiræa which gives such general satisfaction as the form known as *S. Van Houttei*, which is generally considered to have been derived from the Asiatic *S. trilobata*, which is smaller and not so beautiful or graceful as a flowering shrub. *S. Van Houttei* is perfectly hardy, even in such a rigorous winter climate as that at Montreal, in Canada. Besides the beauty of its long sprays of white blossoms, which appear early in June, the plant has the merit of having clean, dark green foliage throughout the remainder of the season. It usually falls, however, without assuming any striking colors in the autumn.

More beautiful and striking in its individual blossoms than any of the preceding kinds are the flowers of *S. Cantoniensis*, which is very frequently found in catalogues and gardens under the name of *S. Reevesiana*. The blossoms are much larger than any of those mentioned, in larger corymbs, and of the purest white color. But, unfortunately, in New England this plant cannot be considered sufficiently hardy to be recommended for general planting. In well-drained, sheltered situations it sometimes thrives fairly well and produces a good show of blossoms, but, under most circumstances, the stems and branches become so much injured in winter that comparatively few blossoms appear in early June, the regular flowering period.

The double-flowered form of this species is quite handsome when well grown, but it suffers equally with the type from lack of hardiness. In a little less rigorous climate *S. Cantoniensis* is one of the most beautiful species which can be grown.

Arnold Arboretum. *J. G. Jack.*

## Hardy Flower Garden.

AT no season of the year does the garden present a prettier appearance than at this season; the gorgeous Oriental Poppies, and the Iceland Poppies too, are at their best, with Pæonies, German Iris, *Dictamnus Fraxinella*, with its flash-light in the evening when fire is applied to it. The Pyrethrums, double and single, are also now showing their full beauty, and the recent exhibits at the meeting of the Massachusetts Horticultural Society indicate plainly that they are fast growing in favor. It is often stated that double Pyrethrums cannot be raised from seed, and this may be true of some seed, but last fall I sowed two packets of seed and the plants were grown on in pots. They are now all in flower, and fifty per cent. are double, the rest being single, and many are as good as imported named kinds. The seeds cost about twenty-five cents and were obtained from Germany. For cutting purposes these "Painted Daisies" are valuable; they last a long time, and, when mixed with sprays of such plants as *Gillenia trifoliata*, have a pretty effect. *Dodecatheon Meadia* is blooming finely, and these American Cowslips are well worth growing, even in the most select borders, but care should be taken to secure bright-colored forms, as those of a pale, undecided pink are not worth the space they occupy. In some localities this Dodecatheon can be obtained of a bright rose color, and this is worth growing. Much can be done, however, toward improving the color of the flowers by applying burnt soil or refuse.

*Helianthus divaricatus*, *Artemisia Pontica* and some other plants which dealers persist in advertising spread rapidly and crowd their way among their neighbors, and are most difficult to get rid of. *Heliopsis lævis* is another weedy subject which seeds abundantly in fall and appears everywhere the following summer. Dealers in hardy plants should never disseminate such subjects without a full explanation of their

habits. Stocking a garden with persistent weeds is rather worse than selling us hardy plants altogether unfitted for outdoor cultivation, a practice not altogether unknown.

Of Aquilegias there is not one prettier than the Rocky Mountain Columbine, *A. cærulea*. It is a pity that it is not a better perennial, for, with the best of care, it does not live long in gardens. If good seed could be obtained fresh from its native localities there would be plenty of purchasers both here and in Europe, as seed of this species is dearer than any other of the older kinds, and it often germinates badly or turns out to be not true to name. After *A. Canadensis*, *A. cærulea* was the first to flower with us, and it is still very beautiful.

S. Lancaster, Mass. *O. O.*

## Hardy Plants for Edging a Border.

STRAIGHT lines, as "the shortest distances between two points," are entitled to some consideration, but we usually have too many of them in our small gardens. In most of the well-kept suburban gardens one can start at the front gate and follow rectilinear paths all through the garden without finding a curve or relief to the trim formality. The lawn is trimmed at the border to the straightest line, and not a twig is allowed to encroach on its smooth surface. The borders following the straight paths are usually edged with grass in narrow lines, a source of constant care, and the whole effect is very prim and formal and sometimes distressing. In our small places we cannot often change the paths, and straight ones are often more in character than curved ones, which in limited grounds seem often in bad taste. But, given such a long path bordered by a flower-bed, why not discard the grass edging and grow plants, which are not only attractive and interesting, but which from their habit of growth will form irregular lines and break the formality? There are innumerable low hardy plants suitable for such a situation, and a border of this kind may be made one of the most interesting features of the garden, if one is willing to give its planting some little study.

To prepare such a border, the ground should be well broken up to a good depth and enriched with manure. The border should be raised about six inches above the path and edged on either side with rough stones. This does not seem an attractive picture, but it will be seen that such a border will exactly suit a large number of plants which require good drainage about their crowns, and, as they are mostly deep-rooting kinds, they will find moisture. On this border should be established dwarf plants, and especially those with procumbent, or creeping, habit. These latter will soon cover the nakedness of the stones, and, as they spread into the path, will form little areas of verdure and bloom, projecting into the desert walk and softening the stiff border-line into gentle undulations. Some of these plants, in time, make spreading clumps several feet in diameter, but while they are reaching this state there will be room to grow on the edging numerous small dwarf alpines and other plants. To mention a few suitable plants among the profusion which might be named, here might grow *Arabis alpina*, *A. albida* and *A. arenosa*; the hardy Alyssums—*A. saxatile*, *A. spinosum* and *A. Montanum* (the latter now in bloom, being a charming plant, with attractive light yellow flowers); *Iberis Gibraltarica*, more hardy on the raised border than it often proves when not in a well-drained situation. Aubrietias find a congenial home in such a border, too, as do the small Sedums—and there is a wealth of dainty beauty in this family. Achilleas, *A. tomentosa*, *A. argentea*, etc., *Thymus montanus*, and many more will occur to those who are familiar with hardy plants. If one were in a hurry and plants were scarce, the Moneywort (*Lysimachia Nummularia*) would soon cover all bare spots, and at this season is very attractive, although a very common plant.

To a lover of small plants such a border is invaluable as a substitute for a rockery and safe location for those which might be lost in an ordinary border.

Elizabeth, N. J. *J. N. Gerard.*

**The Vegetable Garden.**—The Chelsea Pea is an improvement on American Wonder in growing slightly taller and being rather more productive. It was also as early as any of the so-called extra earlies, this season. Its quality is inferior.

Profusion is a promising late pea, and so is the Mayor. Admiral is weak and delicate in growth, too tall, and not productive. The Don is also entirely too rampant in growth. At this date, June 10th, it is still running up, and where it may stop is not yet fully apparent.

The Sandwich Radish we like very much. It is much quicker in growth than most of the white Radishes we have grown. The backward season has retarded the ripening of tomatoes, and we have noted little in regard to any varieties yet. Last year Early Ruby was ripe on the 25th of May; this year it is still green, though in advance of most others. Atlantic Prize seems ahead this season.

Devon Market Lettuce may be different in some respects from the old Curled Simpson, but I have not been able to see it. Golden Beauty Lettuce shows no particular merit above other smooth-leaved Lettuces. Trianon is doing better than we expected of a Cos Lettuce out-of-doors. It will be valuable here if sown earlier than ours was this year.

Raleigh, N. C. *W. F. Massey.*

## The American Association of Nurserymen.

### Annual Meeting at Minneapolis.—II.

OUR report of the Nurserymen's Meeting at Minneapolis, which was begun last week, is continued below, with some additional extracts from the papers read on that occasion and the discussions which followed.

#### THE NORTH-WEST AS A FIELD FOR NURSERY EXTENSION.

Professor Charles A. Keffer, of the South Dakota Agricultural College, read an essay with this title. He said that Iowa, Minnesota, Nebraska and the Dakotas had been planted thickly with orchards and fruit-gardens because they were settled by men who were home-makers as well as farmers, and who wished to reproduce on the prairies the surrounding of their homes in the east and in Europe. The failures have been countless and the successes few. The farmers are prone to attribute their loss in fruit-culture to the false representation of the tree-seller, while the nurserymen feel that a large share of the failure is due to ignorance, to an unfortunate choice of varieties, or to needless haste, that is, to planting fruit-trees before the soil and shelter were ready for them. The climatic conditions here are so trying that some means for modifying them must be devised. It is useless to hope for success with fruit-trees on the prairies until the winds are conquered by groves and forest-belts. A forest-tree can thrive in untoward conditions where a fruit-tree would perish, and the wind-break must be the precursor of the orchard. Grove-planting must be the pioneer work in horticulture, and the farmer of the north-west cannot expect a profitable orchard until he has provided a sheltered location for it. Now that the Government has withdrawn the slight encouragement it once gave to tree-planting it is a matter of vital importance to the north-west that all the persons interested in agriculture and horticulture should unite to promote what may be called prairie-forestry. It seems, then, that the first duty and the first interest of the nurseryman is to push the sale of forest-trees in the treeless west, and, when these are established, there will be abundant demand for other stock.

The Plum is the pioneer fruit of the north-western states, and we are fortunate in having a native species from which many varieties of good quality are being secured. It would certainly promote the interest of the trade if such sorts as the Miner, and all of the Chickasaw family, were discarded, north of central Iowa. Of the more hardy type the Desoto Plum is our standard variety, although in the greater part of Dakota it is too late to be relied upon, for we must have fruits in which early maturity is united with extreme hardiness. The Plum-tree, being found along the streams of western Nebraska, eastern Colorado and both the Dakotas, is presumably hardy, but many varieties are caught by the frost before the fruit ripens. Two years ago I received specimens of fruit that was ripe on the 15th of August, small native red plums of excellent cooking quality. There are now being tested on the grounds of the South Dakota Experiment Station forty varieties, and from some of these we have hopes of securing the two great essentials of hardiness and earliness.

The Apple presents a still more serious problem. The north-west cares little about an Apple-tree's genealogy, whether it is Russian or American, but we want one that will live through the winter and one that has leaves and bark to withstand intense heat and sunshine; and these requisites secured, for the immediate future we will be content with a moderate quantity of fruit of only a moderate quality. Professor Keffer said that he once thought there was no virtue in the fruit of the Crab-apple, but that was before he had moved to South Dakota. He was not prepared to discuss the relative merits of the Russian and other varieties, but only knew that good fruit of Wealthy and Fameuse is grown in the southern counties of his state in peculiarly favorable locations on the borders of the Missouri River bottom-lands.

As to the relative methods of budding and grafting trees he had no question as to the superiority of the latter. Root-grafts

with long cions make the best trees for the north-west. Nurserymen should not send a budded tree into the north-west, for it is always sure to be deficient either in the hardiness of the stock or in the union of the stock and bud. In the development of horticulture in this region nurserymen must educate the people. They must realize that wind and frost and burning heat are to be the portion of every tree that is planted, so that it is idle to sell anything there but the very hardiest stock.

NOTES ON MINNESOTA HORTICULTURE.

The extracts which follow are from an address by Samuel B. Green:

Previous to 1884 Minnesota was generally looked upon by eastern and southern growers as hardly adapted to a rational system of farming, not to speak of anything in the line of fruit-production. In that year she surprised the country by the prizes won and the show of fruit made at the New Orleans Exposition; and the fine exhibition made last year at the State Fair seemed to indicate that there was a possibility that she might do as well at the Columbia Exposition in 1893.

APPLES.—Most of the well-known eastern varieties of Apples have been tried here and found greatly wanting; even the popular, prolific and handsome Ben Davis was discarded years ago as being too tender for this climate, while the Baldwin, Yellow Bell-flower, Roman Stem, Golden Russet, Winesap and a host of other favorites have been repeatedly tried and rejected. In many parts of the state the Wealthy is largely grown and bears early and heavily.

We can grow Crab-apples in great quantities, and our markets are well supplied with this home-grown fruit each season. The most generally esteemed are Transcendent, Orange, Whitney, Early Strawberry, Virginia and Hyslop. Where the old standard varieties of Apples can be grown the Russians may not be welcomed, but in this state they are very promising. Take away from us to-day the Russian Apples and their seedlings, and we would have almost nothing left in a well-tried Apple of large size that can be grown at a profit. The Duchess of Oldenburg and Tetofsky have been long and favorably known here, and our markets are liberally supplied with them each year. Minnesota orchardists who carefully cultivate the Duchess get remunerative returns. Among other Russians of promise that have been quite extensively tried are the Hibernal, Autumn Streaked, Ostrokoff, Glass, White Pigeon, Charlamoff, Green Streaked, Yellow Annis, and we hope and expect that out of the many other varieties now on trial in the state and from seedlings of those Russians to get varieties better adapted for our own use than any now known.

I believe the time is coming when Minnesota will raise enough apples to supply her own wants. It has been found by those having the largest experience that our own home-grown nursery stock stands the rigors of our trying climate much better than Eastern and Southern grown stock.

PLUMS.—We cannot raise the varieties of Plums of the *Prunus domestica* type without giving them winter protection, neither do varieties originating from *P. Chicasa* do well here, but all varieties of *P. Americana* yield abundantly each year, and we think there is a great future for this hardy class of Plums. Each year notes the introduction of new varieties of merit. The best well-tried kind of this class of Plums is the De Soto, but the Forest Garden and Weaver are favorably known, and the Rollingstone, Cheney and New Ulm are new kinds of great promise.

SMALL FRUITS.—All the small fruits grow here and yield abundantly. Strawberries take the front rank in value of the product, but we also raise large crops of raspberries, currants, gooseberries and blackberries. It is generally considered profitable to cover all small-fruit plants in winter, but some growers do not go to the expense of this even with Raspberries. Cranberries can be raised at a profit, and the wild bogs produce in abundance. The fruit raised in Minnesota is of high color, flavor and aroma, and finds a ready market in the large cities and towns of the state.

HORTICULTURAL PROGRESS.—Minnesota established the first purely horticultural experiment station in this country, in 1880, and the State Horticultural Society has to-day, besides the department of horticulture in the central experiment station, one experiment station and eight horticultural trial stations, the most of which are devoted to special lines of work. We believe that by systematic selection and crossing of many fruit-plants now grown, that their value for this climate may be greatly increased, and we also believe that several of our native fruits, notably the Sand Cherry (*Prunus pumila*), the Wild Plum (*Prunus Americana*) and the Buffalo Berry (*Shepherdea argentea*), which are very prolific in their wild state, will well repay careful cultivation. We also look with favor upon the newly introduced Russian Cherries and Pears, and the growing of Peaches, by protecting them in the winter, is attracting some attention.

Alluding to Mr. Green's commendation of the Russian Apples Mr. William C. Barry said that eastern nurserymen were very desirous to ascertain which of these varieties has an established value. Many years ago Russian Apple-trees were imported by eastern fruit-growers, but none of them had been found equal to the Duchess of Oldenburg, and, after taking much pains and trouble with these varieties, they had become discouraged. It would therefore be of advantage if the nurserymen of the north-west who had made experiments would inform eastern nurserymen which Russian Apples ought to be catalogued and disseminated. Mr. Barry had attended a great many exhibitions of fruit in different parts of the country, and he had never seen these apples on the tables, nor had he seen accurate descriptions of them, and he said that it would much more than pay him for his journey to Minneapolis if he could secure one, two, three or more varieties which were as valuable, or nearly as valuable, as the Duchess. If western nurserymen have such varieties he assured them that there was a ready market for them in the east.

Mr. Albaugh added, that in Ohio no Russian Apples, except the Duchess, had proved of real value. Out of thirty-seven grafts obtained from the Iowa Experiment Station only one variety, the Longfield, made a healthy tree at three years old. Every other one was injured by winters which have not hurt the Ben Davis nor affected Yellow Bell.

## Recent Publications.

We have received advance-sheets of a Census Bulletin on the Lumber-mills, Saw-mills and Timber-products of the states of Michigan, Wisconsin and Minnesota. These states embrace the great White Pine area of the north-west, which has been so important in the development of the central portion of the continent. Of course, the returns in this bulletin are of very great interest, but they would be still more valuable if the White Pine had been treated separately as a forest product, since the exhaustion of our Pine supply is a matter of national importance and interest. But it would have been very difficult, and perhaps impossible, to divide the product of the mills so as to show at once the quantity of White Pine and of hardwood manufactured. In the Forestry Report of the Tenth Census, Professor Sargent said: "The value of the lumber product of Michigan, Wisconsin and Minnesota exceeds one-third of the total value of all the lumber manufactured in the United States. This enormous development of the lumber business is due to the excellence of the forests of the Lake region, to the natural advantages of the country for manufacturing lumber, and to the easy communication between these forests and the treeless agricultural region west of the Mississippi River. The country between the Mississippi River and the Rocky Mountains, now largely supplied with lumber from the Lake region, must soon depend more upon the remote Pine forests of the Gulf region or of those of the Pacific coast. But the great north-western pineries are not yet exhausted, and they may be expected to increase the volume of their product for a few years longer to meet the demands of the population fast covering the mid-continental plateau." This prediction is justified in the report before us, which shows an increase of mill products amounting to nearly thirty per cent. in quantity and seventy-six per cent. in value. The increase of the number of hands employed is 138 per cent., and the increase of the total amount of wages paid is 141 per cent. The disproportion between the increase of quantity of the product and its value is due to the fact that the business of finishing and remanufacturing at the point of original production has been developed largely, and this augments the gross value of the product. The increase in the output is probably due, in a large measure, to the increased use of hardwood which, in late years, has been manufactured extensively, especially in the northern peninsula of Michigan.

Minneapolis now stands at the head of the lumber-producing cities of this region, the value of the output here having reached during the census year $6,584,456. In 1880 the value of the output at the same city was $2,740,848, an output exceeded at that time both by that of Bay City and of Muskegon. The increase in this product of Minneapolis is due largely to the opening up of the northern part of Minnesota, a region which ten years ago was worked comparatively little. Of course, this bulletin cannot show the quality of the Pine-timber manufactured, but it may be that while the output is larger, it consists,

to a great extent, of small trees which ten or twenty years ago would have been passed over as of too little value to saw. During the last ten years there has been a sort of clearing up of the forests going on in these states, so that while they make a fair showing in the general output, the area of good Pine-forest is now, beyond question, "dangerously small in proportion to the consumption of White Pine lumber."

The predicted exhaustion of these forests within a comparatively short time seems assured by returns from individual manufacturers. Their present holdings of standing timber in this group of states are only sufficient to supply them for about five years at the present rate of consumption. The quantity in reserve is believed to be principally comprehended by what is standing on lands owned by the federal and state governments. This quantity, however, is unknown. The federal government supplies no information on this subject, but the holdings of public lands reported by state governments indicate that no considerable area of timbered lands is owned by the state of Michigan.

The total area of land held by the state of Wisconsin on September 30th, 1890, is reported at 671,633 acres. Most of this land is located in the northern counties, and about one-half is said to be timbered. The state of Minnesota reports ownership of 13,000,000 acres of timbered land, containing twenty billion feet of standing timber, mostly Pine, valued at $60,000,000.

## Notes.

One of the most attractive shrubs now in bloom is *Philadelphus nivalis*.

Just now the beautiful old Ascension Lily, *L. candidum*, is blooming in unusual abundance in gardens near this city, the disease which has for many years affected this plant having apparently run its course.

An English authority remarks that the growths of the Asparagus which are made this season lay the foundation for the next year's crop, and that, therefore, the stronger the growth of the shoots and roots this year the better prospects for a crop next season. This is true, and it follows that it is not too late still to cover Asparagus-beds with dressings of commercial fertilizers and of well-rotted manure in order to feed the plants and strengthen the growth.

Dr. Riley, of the United States Department of Agriculture, has published a bulletin on some of the more injurious locusts of the United States, together with the means of destroying them. It contains no technical matter, and any farmer will be able to recognize the different species from the figures. The most interesting part of the work is the illustrations of the machines which have been used for the destructions of these pests. Most of the matter is to be found scattered among former reports, but the description of the method used for trapping locusts in Cyprus is new, and so is an account of the method of poisoning them with bran and arsenic, which has been used with success in California.

Among the Columbines nothing is better than *Aquilegia cærulea*. Its white variety, Alba, has been distributed as a variety of *A. chrysantha*, and is one of the best of the white Columbines as we saw it growing recently on the grounds of H. Meyer, Passaic, New Jersey. A striking plant in flower there was *Centauria Ruthenica*, a tall thistle-like plant, three to four feet high, with heads of yellow flowers an inch and a half in diameter and deeply cut leaves. *Scabiosa Caucasica*, one of the best of hardy plants, neat in habit, and with flowers of the richest blue, was also in bloom. *Heuchera sanguinea* seems to have established its reputation for hardiness, although it comes from Arizona, for it was here in perfect health and opening its deep red flowers, although it had been in an exposed situation all winter.

At a late meeting of the Royal Horticultural Society, Mr. Barron, as reported in *The Garden* of May 30th, exhibited several small flowering branches of Apple-trees to show the variations in the size and tint of their blossoms. The largest and showiest blossom was that of the Royal Codlin, the flowers being deeply tinted with dark rose. Lord Derby, rather smaller, had very showy blossoms, and Gravenstein was almost pure white. It would be interesting to make a comparison of the blossoms of varieties which are well known in cultivation in this country, and such a collection would add interest to our spring flower shows. A study of the blossoms, too, as hinted at in *The Garden*, would not be unprofitable in answering such questions as those which follow, and very many more: Are large blossoms usually followed by large-sized fruit? Is there any connection between the color of the blossom and the color of the ripe apple?

Dr. John Dougall, of St. Mungo's College, Glasgow, has a letter in a recent issue of the Glasgow *Herald* on the banana, in which he quotes from Stanley's "In Darkest Africa" to show that "for infants, persons of delicate digestion, dyspeptics, and those suffering from temporary derangements of the stomach, the flour, properly prepared, would be of universal demand." During Stanley's two attacks of gastritis a slight gruel of this flour, mixed with milk, was the only material that could be digested. It is odd, also, as pointed out in Stanley's book, that in most Banana lands—Cuba, Brazil, West Indies—the valuable properties of this fruit as an easily digested and nourishing food have been much overlooked. Dr. Dougall has made some experiments in making banana flour. He concludes that it should be made from the ripe fruit at its place of production. In trying to make it from bananas purchased in Glasgow, he obtained on drying the pulp a tough sweet mass like toasted figs, an appearance probably due to the conversion of starch into sugar. Bananas contain only about fifty per cent. of pulp, and of this about seventy-five per cent. is water. They would yield, therefore, only one-eighth part of flour.

That even Frenchmen of the seventeenth century did not always approve of strictly formal gardens is shown by the following passage, which occurs in an essay by Pierre Huet, a well-known French critic of that time, called "Of the Gardens in Fashion." The author says: "I have no more approval for the gardens in fashion than for sky-lights. I mean those open gardens, composed of large, broad, sand-strewn alleys, of trellises, parterres, adorned only with a few delicate beds, defined by strips of box and edged with a few flowers and a few stunted trees, and in which you can scarce distinguish summer from winter. M. le Nostre, who is quoted as the author of this sort of garden, which, it is asserted, he brought back from Italy, did, it is true, adapt it to the King's Gardens, but he did not adapt it alone, for he added covered alleys, shaped woods, trees of lofty trunk, palisades, and green shades. The majority of private persons, possessing neither sufficient ground nor sufficient means to give their gardens all these ornaments and keep them up, have only adopted its parterres, which require little time and expense, but in which walking is out of the question throughout the day, and in which ladies, regardful of their complexion, would only venture to appear after sunset."

In an article called the "Evolution of Patent Medicine," published in the *Popular Science Monthly* for May, Mr. Lee J. Vance traces the belief in the efficacy of such nostrums back to those ancient times when no distinction was drawn between the physician and the magician, and when all remedies were looked upon as charms—a condition which prevails, of course, among savage and half-civilized tribes in our own times. The names of plants, Mr. Vance explains, shows how general was the belief in their inexplicable virtues. "Some plants have animal prefixes, as, Dog-elder, Dog-rose, Cat's-tail, Cow-bane, etc. Other plants derive their names from religious sources. Thus they are associated with the Virgin Mary, Saint John the Baptist, Saint James. Likewise the Latter-day Saints have particular plants dedicated to their memory. Most of the plants with mystic names were supposed to have magical virtues, and so they were largely used in folk-medicine. The weird associations clustering around many roots and herbs were enough to invest them with great repute," and in folk-medicine, even at the present day, "herbs are used not so much for their inherent medical properties as for their reputed magical virtues. . . . Another stage in the evolution of patent medicine is typified in the therapeutics of medieval mystics and alchemists. The great plant in their pharmacopœia was the Mandrake. Why? Simply because the roots of this plant were shaped like the human body. . . . The magical element in patent medicines actually won scientific repute in the 'doctrine of signatures'—a doctrine which held that plants and minerals, by their external character, indicated the particular disease for which Nature had intended them as remedies. Thus the Euphrasia, or Eyebright, was good for the eyes; the Wood-sorrel, being shaped like a heart, for the heart; the Liverwort for the liver, and so on. Pettigrew, in his history of medical superstition, says that this fanciful and magical notion 'led to serious errors in practice' and often to fatal results. Observe that at this stage of its evolution patent medicine is herb medicine, and so it remained for a long time. The materials of the healing art were all vegetable. The patent-medicine man was a dealer in herbs."

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